

3.0 L-Bar, New Mexico, Disposal Site

3.1 Compliance Summary

The L-Bar, New Mexico, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title II Disposal Site was inspected on August 26, 2008. The tailings impoundment is in good condition. Erosion is active in several areas of the site associated with the diversion channels, and repairs are scheduled for 2009 to prevent an impact on the integrity and function of the tailings impoundment and diversion structures. Site maintenance activities conducted during the past year included installation of new sections of barbed-wire fence to accommodate grazing and to isolate erosion areas, installing caution signs at the sediment trap and East Channel, and treating tamarisk plants with herbicide. Groundwater monitoring results indicate that all compliance requirements continue to be met. Erosion and vegetation measurements to monitor the condition of the impoundment cover indicate that no erosion is occurring and, overall, the foliar cover of the vegetation is increasing. No cause for a follow-up inspection was identified.

3.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the L-Bar, New Mexico, Disposal Site are specified in the *Long-Term Surveillance Plan [LTSP] for the U.S. Department of Energy L-Bar, New Mexico, (UMTRCA Title II) Disposal Site, Seboyeta, New Mexico* (DOE-LM/GJ709-2004, September 2004) and in procedures established by the U.S. Department of Energy (DOE) to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.28 (10 CFR 40.28). Table 3-1 lists license requirements for this site.

Table 3-1. License Requirements for the L-Bar, New Mexico, Disposal Site

| Requirement | Long-Term Surveillance Plan | This Report |
|--|-----------------------------|---------------|
| Annual Inspection and Report | Section 3.3 and 3.4 | Section 3.3.1 |
| Follow-up Inspections | Section 3.5 | Section 3.3.2 |
| Routine Maintenance and Emergency Measures | Section 3.6 | Section 3.3.3 |
| Environmental Monitoring | Section 3.7 | Section 3.3.4 |

Institutional Controls—The 738-acre disposal site is owned by the United States of America and was accepted under the U.S. Nuclear Regulatory Commission (NRC) general license (10 CFR 40.28) in 2004. DOE is the licensee and, in accordance with the requirements for UMTRCA Title II sites, is responsible for the custody and long-term care of the site. Institutional controls at the disposal site, as defined by DOE Policy 454.1, consist of federal ownership of the property, a perimeter fence around the impoundment and associated structures, warning/no trespassing signs placed along the perimeter fence, and a locked gate at the site entrance. Verification of these institutional controls is part of the annual inspection. No off-site institutional controls are needed because contaminated groundwater is contained within the federal land boundary.

3.3 Compliance Review

3.3.1 Annual Inspection and Report

The disposal site, located approximately 10 miles north of Laguna, New Mexico, and 2 miles east of Seboyeta, New Mexico, was inspected on August 26, 2008. Results of the inspection are described below. Features and photograph locations (PLs) mentioned in this report are shown on Figure 3–1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

3.3.1.1 Specific Site Surveillance Features

Access, Gates, Fences, and Perimeter Signs—Access to the site is via an all-weather public gravel road (Cibola County Road 1). Approximately 300 feet of Cebolleta Land Grant (Land Grant) property is crossed to enter the site, and access is provided for and described in the Warranty and Quitclaim Deed for the disposal site. Portions of the site are accessed via dirt roads.

The site entrance gate is a tubular metal stock gate located along a barbed-wire perimeter fence. The entrance gate was locked and in excellent condition.

A five-strand barbed wire stock fence encompasses the tailings impoundment and associated drainage structures, and is intended to prohibit trespassing and livestock use on the disposal cell structures. The fence is located as much as 3,300 feet inside the property boundary, and the area between the fence and the boundary is grazed in accordance with a DOE grazing license with the Land Grant that owns the surrounding property.

Additional sections of four-strand barbed-wire fence were installed during the past year. Two sections totaling approximately 1,600 feet were added along the west side of the site to close gaps between the cell perimeter fence and Land Grant fences to accommodate grazing activities.

- 3A Land Grant ranchers will maintain these sections. Another 3,000-foot section was installed in the southeast portion of the site to enclose an erosional area that it scheduled to be repaired in 2009. This fence has two wire gates (PL–1) and one metal personnel gate (PL–2). This section will be maintained by DOE and kept in service at least until the repaired area has successfully revegetated.

Entrance signs installed on metal posts are located at three access points to the site (PL–3).

- 3B Thirty-one perimeter warning/no trespassing signs are attached to the barbed-wire fence at approximately 500-foot intervals. The perimeter signs were in excellent condition. Perimeter signs also were installed near the three gates on the new fence in the southeast portion of the site.

Site Markers and Boundary Monuments—The granite site marker, located north of the disposal cell adjacent to the site access road (PL–3), was in excellent condition. Metal t-posts were installed after the 2005 inspection to help inspectors find the eight flush-mounted boundary monuments; the monuments were not checked in 2008.

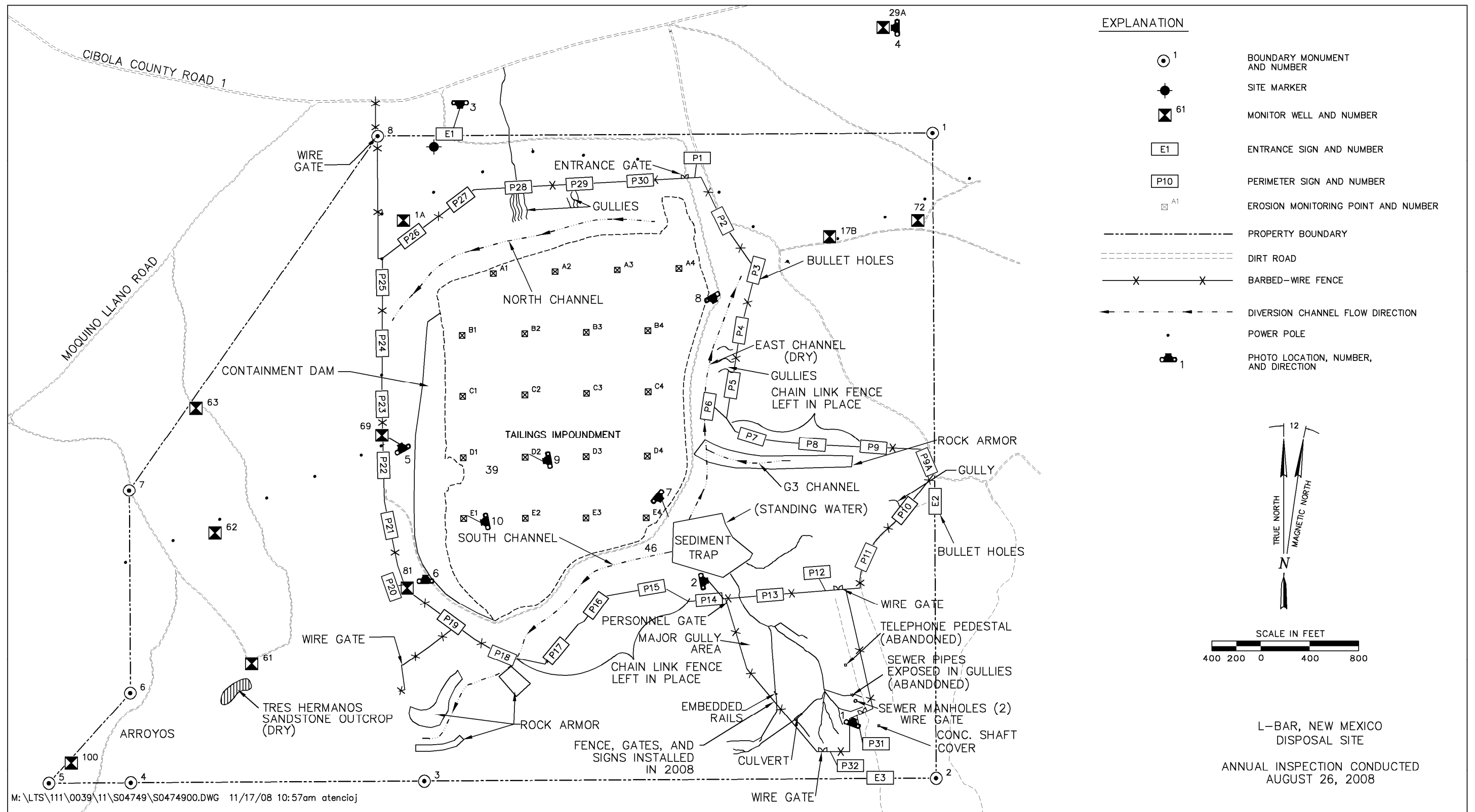


Figure 3-1. 2008 Annual Compliance Drawing for the L-Bar, New Mexico, Disposal Site

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Monitor Wells—The site groundwater-monitoring network consists of ten wells. Nine of the wells are located on the DOE site; background monitor well MW-29A is located outside the northeast corner of the site. The concrete pads of several of the wells have deteriorated and will be repaired (PL-4). A wooden stile was installed after the 2007 inspection to allow samplers to safely cross the fence to access monitor well MW-69 (PL-5). Some well locations do not have established access roads or tracks but are accessible by 4-wheel-drive vehicle as long as the ground is dry.

3.3.1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into four areas referred to as transects: (1) the cover of the tailings impoundment; (2) the containment dam; (3) the diversion channels; and (4) the site perimeter, outlying areas, and balance of the site.

Within each transect, inspectors examined specific site surveillance features, such as monitor wells, boundary monuments, and signs. Each transect was inspected for evidence of erosion, settling, slumping, or other disturbance that might affect site integrity, protectiveness, or the long-term performance of the site.

Cover of the Tailings Impoundment—The tailings impoundment, completed in 2000, occupies approximately 100 acres. The cover consists of a compacted clay layer overlain by clay-rich soil and ranges from 6 to 10 feet thick. Its surface is minimally sloped to the west toward the central portion of the containment dam to promote drainage and minimize runoff water velocities and the potential for erosion. The cover was not seeded; revegetation is occurring naturally with native species. The establishment and maturing of vegetation is expected to reduce wind and water erosion of the surface and mitigate precipitation and runoff infiltration to the radon barrier.

Several low areas on the surface tend to accumulate runoff after storm events; however, there was no standing water at the time of the inspection. The low areas, which are no more than a couple of inches below the surrounding grade, most likely resulted from wind erosion and/or minor settling shortly after the impoundment cover was completed. Wind-deposited, elongate mounds of fine-grained soil formed immediately downwind of old stalks from sunflower and kochia plants. The mounds are stable, and vegetation continues to establish on them. The ephemeral pools of water and windblown deposits do not impair the function of the cover materials.

Cracks remain in the surface soil over much of the cell cover. They are confined to the cover soil and do not extend into the radon barrier. The cracks appear to be the result of drying of the gypsum-rich cover soil after being saturated during rainfall events. Although they are expected to heal as perennial vegetation continues to establish, the cracks will be monitored to ensure that the underlying radon barrier is not compromised.

In accordance with the LTSP, erosion and vegetation are monitored on the impoundment cover. A description of the monitoring program and the results to date are presented in Section 3.3.4.2.

Containment Dam—The tailings impoundment was constructed by damming the upper portion of a natural drainage basin. The face of the earthen containment dam has a 20 percent slope and is rock-armored to prevent erosion and degradation. Native vegetation is encroaching on the face, which is desirable for increasing the erosion protection of the surface (PL-6). There were

no indications of erosion, settlement, seepage, or other modifying processes that might affect the integrity of the dam.

Diversion Channels—The surface water diversion system consists primarily of the East, North, and South Channels that divert runoff water away from the impoundment. The system is designed to accommodate probable maximum flood discharges.

3D Runoff from the watershed upgradient of the tailings impoundment is designed to be conveyed away from the site to a northeastward-flowing drainage via the East Channel. The East Channel is separated from the impoundment by a riprap-armored dike. A tributary channel, the G3 Channel, was constructed to divert runoff from a smaller watershed into the East Channel. Standing water was present in the sediment trap; however, the East Channel was dry at the time of the inspection. Caution signs to identify water hazards at the sediment trap and the East Channel were installed during spring 2008 (PL-7).

3E Storm runoff is expected to drop a significant portion of its sediment load in a sediment trap constructed at the base of the watershed before overtopping the trap and entering the East Channel. The sediment trap is designed to function for 600 years prior to needing to be excavated. Runoff from several significant storm events in 2005 and 2006 caused deep gullies to form in the soft soils and fill materials upgradient of the sediment trap, resulting in a substantial amount of sediment deposition in the sediment trap. This area continues to erode and repairs are planned for 2009 to reduce the amount of sediment being transported to the sediment trap.

Gullies have also formed along the north slope of the G3 Channel. The erosion is not degrading the function of the channel, but gullies are encroaching the perimeter fence in that area. This area will be monitored and repairs will be made as needed to ensure the integrity of the fence.

3F Significant erosion is occurring along the east slope of the East Channel (PL-8). Repairs of this area are planned for 2009.

3G Runoff water from the area north of the tailings impoundment is captured by the North Channel. The water is diverted away from the site to the west. Deep gullies have formed and continue to erode along a portion of the north slope of the channel. This erosion is depositing sediment in the channel, although not currently to the extent that the function of the channel is degraded. However, repairs are scheduled for 2009 to prevent this from occurring.

The South Channel diverts storm runoff from the higher terrain immediately south of the tailings impoundment toward the channel outlet to the west. Two riprap aprons are present on the north-facing slope to inhibit erosion along natural drainage paths. Minor erosion is occurring on the unprotected slope surfaces but is not degrading the function of the channel or affecting the integrity of the tailings impoundment.

Site Perimeter, Outlying Areas, and Balance of the Site—The site is surrounded by open private land that is used primarily for grazing. The original grazing license between DOE and the Land Grant allowed grazing on DOE property outside the former mill site chain-link fence. The area accessible to grazing increased with the removal of that fence; consequently, the license was amended in 2007 to allow grazing on DOE property outside of the barbed-wire fence.

Due to vandalism and trespassing issues at the site, a local contractor has been retained to check site security periodically, remove trespassing livestock, and repair fences. Uranium exploration

activities and associated access road construction are occurring on properties adjacent to the site. These activities do not appear to be detrimental to site security.

The Tres Hermanos Sandstone unit of the Mancos Shale Formation crops out in the southwest corner of the site. This unit is hydraulically connected to contaminated groundwater under the impoundment, and the outcrop is considered to be a potential seep area. There was no indication of seepage from the outcrop. This location will continue to be monitored for seepage and recommended for sampling if seep water is present.

Several legacy features including concrete pads (a large pad covers the mine shaft) and sewer manholes are present near the southeast corner of the site. These features will be monitored to ensure that they remain secure.

3.3.1.3 Noxious Plants

3H Tamarisk, commonly known as salt cedar, is present on the impoundment cover, in diversion channels, and in other locations downstream of the impoundment. Stands of mature tamarisk are common in the arroyos in the vicinity of the site. In accordance with State of New Mexico requirements, tamarisk needs to be controlled at the site to eliminate it as a seed source. Tamarisk plants on the site are sprayed with herbicide once or twice per year.

No tamarisk plants were observed on the impoundment cover at the time of the inspection, but numerous seedlings and small shrubs were found at several locations on the site. These plants will be sprayed with herbicide prior to the next inspection. Efforts to control tamarisk on the site will continue, especially on the cell and in the drainage channels; however, eradication is not likely due to the widespread presence of the plant in the vicinity of the site. No other noxious plants were noted during the inspection.

3.3.2 Follow-up Inspections

DOE will conduct follow-up inspections if (1) a condition is identified during the annual inspection or other site visit that requires a return to the site to evaluate the condition, or (2) DOE is notified by a citizen or outside agency that conditions at the site are substantially changed. A follow-up inspection occurred in February 2008 to evaluate erosion areas for repairs.

3.3.3 Routine Maintenance and Emergency Measures

Maintenance activities during the past year included installing new barbed-wire fences, spraying tamarisk plants with herbicide, and installing caution signs at the sediment trap and East Channel. A local subcontractor checked the site at least twice per month for evidence of trespassing and to ensure that the perimeter fence is intact.

Emergency measures are corrective actions that DOE will take in response to unusual damage or disruption that threaten or compromise site health and safety, security, integrity, or compliance with 40 CFR 192. No emergency measures were required in 2008.

3.3.4 Environmental Monitoring

3.3.4.1 Groundwater Monitoring

- 3I Groundwater monitoring is required at the L-Bar site. The monitoring network consists of ten DOE wells located on or adjacent to the site and two Moquino Water Users Association wells located approximately 2 miles west of the site in the village of Moquino. Table 3–2 lists the wells that are in the monitoring network. Samples are analyzed for chloride, nitrate (nitrate + nitrite as nitrogen), selenium, sulfate, total dissolved solids, and uranium. Analytical results will be compared to the alternate concentration limits (ACL) and alternative abatement standards (AAS) provided in Table 3–3.

*Table 3–2. Groundwater Monitoring Network
for the L-Bar, New Mexico, Disposal Site*

| Monitor Well | Network Application |
|--------------------|--------------------------------------|
| MW–1A | POC source zone well |
| MW–17B | POC source zone well |
| MW–29A | Background well |
| MW–61 | Seepage indicator well |
| MW–62 | Seepage affected area indicator well |
| MW–63 | POE seepage indicator well |
| MW–69 | POC source zone well |
| MW–72 | POE well on east property boundary |
| MW–81 | POC source zone well |
| MW–100 | POE well on west property boundary |
| Moquino Well (new) | Water users supply well in Moquino |
| Moquino Well (old) | Backup supply well in Moquino |

Key: POC = point of compliance; POE = point of exposure

*Table 3–3. Groundwater Alternate Concentration Limits and Alternate Abatement Standards
for the L-Bar, New Mexico, Disposal Site*

| Analyte | New Mexico Standard | ACL (MW–1A, 17B, 69, 81) | AAS Source Zone (MW–1A, 17B, 69, 81) | AAS Affected Area (MW–62) |
|-----------------|---------------------|-----------------------------|---|------------------------------|
| Chloride (mg/L) | 250 | N/A | 1,127 | N/A |
| Nitrate (mg/L) | 10.0 | N/A | 1,180 | N/A |
| Selenium (mg/L) | 0.05 | 2.0 | 2.0 | N/A |
| Sulfate (mg/L) | 4,000 ^a | N/A | 13,110 | 5,185 |
| TDS (mg/L) | 5,880 ^a | N/A | 20,165 | 7,846 |
| Uranium (mg/L) | 5.0 | 13.0 | 13.0 | N/A |

^aBackground value.

Key: AAS = alternate abatement standard; ACL = alternate concentration limit; mg/L = milligrams per liter; N/A = not applicable; TDS = total dissolved solids

The intent of the annual monitoring is to determine the effect of discontinuing the barrier well pumping on groundwater quality at the site. If annual monitoring results demonstrate that seepage from the impoundment is under control (i.e., no significant upward trends in wells MW–61, MW–62, and MW–63), after 3 years the sampling frequency will be reduced to once every 3 years in accordance with the LTSP. Groundwater monitoring will continue as long as a New Mexico Standard (Table 3–3) is exceeded in any well.

If an ACL or AAS is exceeded in the specified wells (Table 3–3), DOE will inform NRC of the exceedance and conduct confirmatory sampling. If confirmatory sampling verifies the exceedance, DOE will develop an evaluative monitoring work plan and submit that plan to NRC for review prior to initiating the evaluative monitoring program. Results of the evaluative monitoring program will be used, in consultation with NRC, to determine if corrective action is necessary.

Annual groundwater monitoring was conducted in November 2007, and the results are provided in Table 3–4. The old Moquino well was out of service and could not be sampled.

Table 3–4. November 2007 Groundwater Monitoring Results at the L-Bar, New Mexico, Disposal Site

| Monitor Well | Analyte (mg/L) ^{a,b} | | | | | |
|--------------------|-------------------------------|---------|----------|---------|--------|---------|
| | Chloride | Nitrate | Selenium | Sulfate | TDS | Uranium |
| MW–1A | 310 | ND | 0.0003 | 3,400 | 6,100 | 0.002 |
| MW–17B | 450 | 680 | 0.26 | 4,900 | 12,000 | 0.028 |
| MW–29A | 150 | 0.03 | 0.0003 | 4,200 | 6,800 | 0.0001 |
| MW–61 | 110 | 0.05 | 0.0002 | 3,300 | 5,000 | 0.0003 |
| MW–62 | 45 | 0.02 | ND | 560 | 1,500 | ND |
| MW–63 | 45 | 0.02 | ND | 520 | 1,400 | ND |
| MW–69 | 590 | 31 | 0.0059 | 7,900 | 17,000 | 4.5 |
| MW–72 | 160 | 3.1 | 0.0081 | 3,900 | 6,000 | 0.0062 |
| MW–81 | 160 | 14 | 0.042 | 4,800 | 7,800 | 0.019 |
| MW–100 | 32 | 0.50 | 0.00026 | 2,500 | 3,900 | 0.0014 |
| Moquino Well (new) | 3.9 | 0.014 | 0.000035 | 120 | 530 | 0.00025 |

^a Significant digits are reported by the laboratory and are based on detection limits.

^b *Italicized* results exceed a New Mexico standard.

Key: mg/L = milligrams per liter; ND = not detected (below detection limit); TDS = total dissolved solids

3J No ACL or AAS Source Zone levels were exceeded in any of the POC wells, and no AAS Affected Area levels were exceeded in MW–62. Therefore, the groundwater at the site is in compliance with the LTSP requirements. No upward trends are occurring for any of the analytes in wells MW–61, MW–62, or MW–63; therefore, monitoring will be reduced to every 3 years starting in 2010. At least one New Mexico standard is exceeded in six of the DOE wells, including background well MW–29A (sulfate and TDS), so groundwater monitoring at the site is expected to continue.

3.3.4.2 Erosion Monitoring Program

3K As required by the LTSP, an erosion-monitoring program (EMP) was developed to address potential erosion of the tailings impoundment cover over time. Sohio Western Mining Company developed the plan at the request of the New Mexico Water Quality Control Commission as a condition for granting Alternate Abatement Standards for groundwater at the L-Bar site.

The cover of the impoundment consists of a 4.1-foot-thick (minimum) compacted layer of clay, to function as a radon barrier, overlain by clay-rich soil materials. Total thickness of the cover ranges from 6 to 10 feet. The cover, completed in 2000, was not seeded, so revegetation is occurring naturally with locally occurring annual and perennial plant species. Vegetation is expected to help mitigate wind and water erosion.

The EMP consists of two parts: (1) measuring erosion and (2) measuring the progress of revegetation. Measurements were made during the annual site inspection on August 26, 2008.

Erosion Monitoring—In accordance with the EMP, the former licensee installed a grid of 20 evenly spaced monitoring points on the cover in November 2003. These points are shown on Figure 3–1. The locations were measured in December 2003 to establish a baseline data set.

Each monitoring point consists of a reinforcing bar (rebar) surrounded by three metal t-posts that were installed to help locate the rebar and provide orientation for the measurements. A 5-foot-long piece of half-inch-diameter epoxy-coated rebar was driven at each point such that approximately 1 foot remained above the cover surface. Each rebar has a metal tag indicating the point location number. The t-posts are set approximately 6 feet from the rebar and form an equilateral triangle, with one point of the triangle due east from the rebar. As an additional identification aid, the t-posts have been sprayed with orange anti-rust enamel paint.

Erosion measurement is accomplished by placing a 4-foot-long level centered at the base of the rebar such that the east end of the level points to the easternmost t-post (PL–9). The height of the rebar is measured from the base of the level to the top of the rebar and is recorded to the nearest 1/16-inch, in accordance with the method established during baseline measurements in 2003.

In accordance with Appendix C of the LTSP, erosion measurements will be performed annually for 20 years (through 2024), and once every 10 years for the following 80 years. The decision point for considering erosion “excessive” will be reached when 2 feet of erosion is noted at more than half of the monitoring points. If this occurs, DOE will initiate discussions with NRC to assess likely remedial scenarios and develop an appropriate mitigation protocol, if required.

Results of the 2008 measurements are presented in Table 3–5. Baseline measurements are included for comparison. As indicated in Table 3–5, the surface elevation has increased at all of the monitoring points except D2 when compared to the baseline measurements, with increases ranging up to 1.5 inches. Therefore, the surface of the disposal cell is accreting instead of eroding. The soil cover includes weathered Mancos Shale, which often contains high concentrations of swelling clay and gypsum. When the surface is dry, it is characterized by cracked and fluffy soil, often resulting in minor fluctuations in surface elevation of the cover. Also, the amount of vegetation on the cover has increased substantially since 2003, which may be raising the surface elevation through root growth, accumulation of organic materials in the surface soil, and/or trapping of windblown sediment derived from locations upwind of the tailings impoundment.

*Table 3–5. Erosion Monitoring Measurements on the L-Bar, New Mexico,
Tailings Impoundment Cover*

| Monitoring Point | Length of Rebar Above Surface (inches) | | | | Change in Surface Elevation ^a Baseline to Present (decimal inches) |
|------------------|--|-----------|------------|-----------|---|
| | 2003 (Baseline) | | 2008 | | |
| | (fraction) | (decimal) | (fraction) | (decimal) | |
| A1 | 12 10/16 | 12.625 | 11 2/16 | 11.125 | 1.500 |
| A2 | 12 7/16 | 12.438 | 11 15/16 | 11.938 | 0.500 |
| A3 | 12 15/16 | 12.938 | 11 12/16 | 11.750 | 1.188 |
| A4 | 12 6/16 | 12.375 | 11 7/16 | 11.438 | 0.938 |
| B1 | 12 10/16 | 12.625 | 11 10/16 | 11.625 | 1.000 |
| B2 | 12 8/16 | 12.500 | 12 2/16 | 12.125 | 0.375 |
| B3 | 13 | 13.000 | 12 1/16 | 12.063 | 0.938 |
| B4 | 12 15/16 | 12.938 | 12 1/16 | 12.063 | 0.875 |
| C1 | 12 8/16 | 12.500 | 11 8/16 | 11.500 | 1.000 |
| C2 | 13 1/16 | 13.063 | 12 12/16 | 12.750 | 0.313 |
| C3 | 12 2/16 | 12.125 | 11 6/16 | 11.375 | 0.750 |
| C4 | 12 6/16 | 12.375 | 11 14/16 | 11.875 | 0.500 |
| D1 | 12 7/16 | 12.438 | 11 8/16 | 11.500 | 0.938 |
| D2 | 12 12/16 | 12.750 | 12 5/16 | 12.313 | 0.438 |
| D3 | 12 3/16 | 12.188 | 11 6/16 | 11.375 | 0.813 |
| D4 | 12 12/16 | 12.750 | 12 11/16 | 12.688 | 0.063 |
| E1 | 13 1/16 | 13.063 | 12 3/16 | 12.188 | 0.875 |
| E2 | 12 14/16 | 12.875 | 12 3/16 | 12.188 | 0.688 |
| E3 | 12 9/16 | 12.563 | 12 1/16 | 12.063 | 0.500 |
| E4 | 12 15/16 | 12.938 | 11 15/16 | 11.938 | 1.000 |

^aA positive change indicates that the surface elevation at that point increased.

Vegetation Monitoring—Ten vegetation monitoring locations were established in accordance with the EMP. Plots were established at erosion monitoring points A1, A3, B2, B4, C1, C3, D2, D4, E1, and E3. At each location, the three t-posts were used to form three corners of the plot; the fourth point was projected south of the easternmost t-post to form a parallelogram covering approximately 100 square feet.

The primary requirement is to measure the percentage of the foliar cover (canopy) of all live vegetation (annual and perennial plants together) within the plot. Percent foliar cover represents the approximate total area under the maximum circumference of each of the live plants within the plot.

The average foliar cover of live vegetation in the vicinity of the L-Bar disposal site, according to the U.S. Department of Agriculture, is approximately 25 percent. The predominant vegetation in the area consists of perennial grasses, forbs, and shrubs. In accordance with the EMP, DOE will perform annual vegetation measurements until at least 20 percent foliar cover is achieved, and this criterion will be satisfied when more than half of the measurement plots exceed 20 percent cover. Because annual and biennial plants do not necessarily germinate each year, and their germination is highly dependent upon weather conditions, it is assumed that this criterion is based on perennial foliar cover. If a significant reduction in plant density is noted during an annual site inspection, then the plots will be measured again. And, if the plant coverage is less

than 20 percent, annual vegetation monitoring will be reinstated until the termination criterion has again been satisfied.

Vegetation types, percentage of foliar cover, litter (organic detritus often consisting of dead annual plants), rock, and bare ground were recorded at each monitoring location (PL-10). Annual or biennial plant species noted at the plots during the 2008 monitoring event included kochia, Russian thistle, annual sunflower, curly-cup gumweed, spotted spurge, and southern goldeneye. Perennial plant species included Nelson's globemallow, silverleaf nightshade, bottlebrush squirreltail, sand dropseed, galleta grass, broom snakeweed, rubber rabbitbrush, and four-wing saltbush.

Table 3-6 compares perennial plant foliar cover between 2005 and 2008. Only three of the ten vegetation monitoring plots had 20 percent or greater foliar cover in 2005, and four of them had 20 percent or greater in 2008. Overall, perennial plant foliar cover has increased in five of the ten plots from 2005 to 2008. Most of the plots containing little or no perennial vegetation are in areas that seasonally become ponded. Monitoring will continue until at least six (more than half) of the plots meet or exceed the 20 percent foliar cover requirement based on perennial plant measurements.

Table 3-6. Perennial Plant Foliar Cover on the L-Bar, New Mexico, Tailings Impoundment Cover

| Plot Location | Percent Perennial Plant Foliar Cover in Monitoring Plots | |
|---------------|--|------|
| | 2005 | 2008 |
| A1 | 57 | 42 |
| A3 | 11 | 28 |
| B2 | 0 | 0 |
| B4 | 20 | 43 |
| C1 | 22 | 18 |
| C3 | 0 | 5 |
| D2 | 2 | 1 |
| D4 | 0 | 0 |
| E1 | 2 | 27 |
| E3 | 8 | 14 |

3.3.5 Photographs

| Photograph Location Number | Azimuth | Description |
|-------------------------------|---------|--|
| PL-1 | 20 | New perimeter sign P31 at the southeast wire gate of the new fence. |
| PL-2 | 80 | Personnel gate at the northwest corner of the new fence. |
| PL-3 | 180 | Entrance sign E1 and site marker. |
| PL-4 | 270 | Cracked concrete of well MW-29A pad. |
| PL-5 | 330 | Stile to cross fence at monitor well MW-69. |
| PL-6 | 0 | View north along the tailings impoundment dam showing encroachment of native vegetation. |
| PL-7 | 130 | Sediment trap and caution sign. |
| PL-8 | 150 | East channel and caution sign; gullies on east slope. |
| PL-9 | 260 | Erosion monitoring point and vegetation plot D2. |
| PL-10 | 260 | Erosion monitoring point and vegetation plot E1. |



BAR 8/2008. PL-1. New perimeter sign P31 at the southeast wire gate of the new fence.



BAR 8/2008. PL-2. Personnel gate at the northwest corner of the new fence.



BAR 8/2008. PL-3. Entrance sign E1 and site marker.



BAR 8/2008. PL-4. Cracked concrete of well MW-29A pad.



BAR 8/2008. PL-5. Stile to cross fence at monitor well MW-69.



BAR 8/2008. PL-6. View north along the tailings impoundment dam showing encroachment of native vegetation.



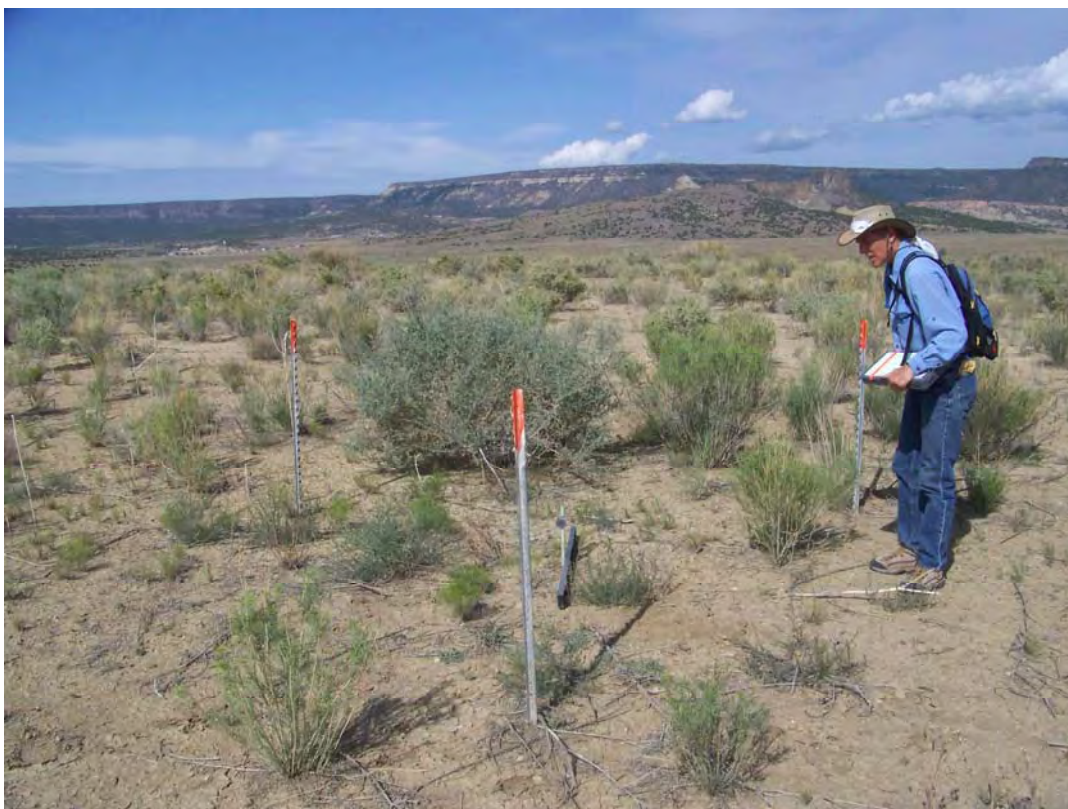
BAR 8/2008. PL-7. Sediment trap and caution sign.



BAR 8/2008. PL-8. East channel and caution sign; gullies on east slope.



BAR 8/2008. PL-9. Erosion monitoring point and vegetation plot D2.



BAR 8/2008. PL-10. Erosion monitoring point and vegetation plot E1.